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ABSTRACT

The development and use of the GATB in the United States is presented by a Canadian author. The history of establishing the norms for the GATB is also discussed. The use of the GATB as a counseling and selection tool is outlined while another section of the article points out the advantages and disadvantages of the test battery. There are also nine charts and graphs in the appendix suitable to be used with a presentation. (MPJ)

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THE GENERAL APTITUDE TEST BATTERY

Lucille Goguen

Paper presented at the Atlantic
Regional Convention of the
Canadian Guidance and Counselling
Association.

Halifax, Canada
May 13, 1976

CG011129

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1 - DEVELOPMENT

The need for a compact and reliable instrument which would measure an individual's basic aptitudes and which could be used as a tool for employment counselling was felt by the United States Employment Service in the early 1940's. Up to that time, there had been a proliferation in the construction of ability tests. Over 100 of them had been developed and their use in counselling was marked by a considerable lack of uniformity.

It was decided to subject these tests to a factor analysis. Out of the 100 tests available, 59 were combined into several experimental batteries and administered to a group of 2,156 persons from 12 different cities. The sample consisted of an all male group enrolled in military defense courses. The subject ranged in age from 17 to 39 with a mean of 28 years. Education ranged in years from 8 to 16 with a mean of 11 years. Though the group lacked in heterogeneity, the subjects were assumed to be similar in experience to the average Employment Service client. The results of the factor analysis yielded 10 factors measured by 15 different tests included in the test battery on the basis of their internal validity (determined by the size of the factor loading of the test) and their external validity (determined by the relationship between each test and the criterion of success). This constituted the first form of the GATB-B1001.

As this first form was still awkard to administer and score, a separate-answer-sheet form was devised. Work on the new form began in 1952 and involved the following steps:

- Answer sheets were developed to facilitate the administration of the test.

- New test items were constructed and in addition, all items included in the first form were revised and converted to a multiple-choice format.

- The experimental tests were then administered to 2,000 people from seven different states.

- Following the obtainment of the results, an item analysis was performed to determine the discriminatory power and the difficulty level of each item in the new battery.

- Items that were too easy were eliminated at the exception of a very few that were retained for inclusion in the practice exercises given before each test.

- Following a detailed analysis, it was decided to drop some of the tests which showed poor discriminating power.

- Also two aptitudes from the first battery, Aiming and Motor Speed were combined into one now called, Motor-Coordination.

The result was the formation of GATB B-1002 which includes 12 tests measuring nine different aptitudes. The GATB now has equivalent alternate forms B-1002A and B-1002B of which Parts 8 to 12 are the same. There is a separate set of conversion tables for each form. The battery consists of eight paper and pencil tests and 4 apparatus tests. The total administration time is 2½ hours with exactly 48 minutes of testing.

The scoring is easily done by hand or by optical scanning equipment. Three different answer sheets are available:

- The IBM 805
- The IBM 1230
- The NCS answer sheet

The nine aptitudes represent eight distinct factors and one factor, General Learning Ability (G) which is common to all others. Aptitude G which is highly related to academic performance is measured by the tests also used to measure the Verbal, Numerical and Spatial Aptitudes. It intercorrelates well with five aptitudes, the highest being the Numerical.

The strongest intercorrelations are found among the cognitive abilities (G, V, S and N) and the lowest are found between the cognitive and motor abilities.

The results of a study conducted with 23,428 subjects yielded intercorrelation coefficients ranging from .10 (V,M) to .86 (G,N) with a median intercorrelation of .44. Except for Aptitude G, the intercorrelation between the aptitudes is relatively low.

Further proof of the validity of the test comes from its high correlations with widely used tests such as the Differential Aptitude Test, the Beta Revised Examination Scale and the Wechsler Adult Intelligence Scale. The validity coefficient of the battery is around .60 and the reliability coefficients of the test-retest situations are between .80 and .90.

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II NORMS

The main philosophy underlying the GATB is the prediction of job performance based on a person's measured aptitudes. To this end three sets of norms were developed. These are:

- the General Working Population Norms
- the Norms for the Specific Occupations
- the Occupational Aptitude Pattern Norms

1. *General Working Population Norms*

First the battery was intended to be a sensitive measure of one's aptitudes in relation to those of the working population. This called for general working population norms. These norms were established on a sample of 4,000 cases who were tested with the first norm of the GATB. The sample was stratified to make it proportionally representative of the base population with respect to certain controlled factors such as occupation, sex, age, and geographic distribution. The mean age of the sample was 30.4 years with a standard deviation of 9.9.years. The range was 16 to 54. The mean education was 11 years with a standard deviation of 2.6 years.

Since the general working population sample had been tested with the first form of the GATB, B-1001, studies were conducted to compare and relate the scores to those of the new, separate-answer-sheet form. Comparability studies were also done between scores of Form A and Form B of that new battery. The raw test scores were converted to standard scores with a Mean of 100 and a Standard Deviation of 20. Since five of the nine aptitudes are measured by more than one test, these tests were assigned a special conversion weight for each aptitude measured. A unit weight was assigned to those tests measuring a single aptitude.

2. *Norms for Specific Occupations*

In addition to being an exploratory device for determining aptitudes, the battery was also intended to predict job success on the basis of these aptitudes. The next step, therefore, was to determine the aptitudinal requirements for specific occupations. A new set of norms was constructed for these occupations. This process involved several steps:

Job Analysis

- first, a thorough analysis was conducted of the job duties and the worker characteristics required in a particular job. The aptitudes included in the final test norms were chosen on the basis of this qualitative analysis along with some statistical evidence. An aptitude was considered for inclusion in the final norms if it was rated important to job performance and had supporting statistical evidence; also if it was rated critical to job performance even without statistical evidence. An aptitude was not considered for inclusion in the final norms if it was rated irrelevant to job performance even with supporting statistical evidence.

Criterion:

- The next step consisted in finding a suitable criterion. The criterion is the link between aptitudes and job performance. It was necessary to assure its reliability and validity. Also in this case the criterion was dichotomized. Since the method used to predict job success from aptitudes employs cutting scores (the level in any aptitude below which functioning is too low for adequate performance on a specific job) it was

important to structure the criterion accordingly. This was done by consulting with supervisors, foremen and instructors to find high and low or satisfactory performance.

Population Sample:

- The samples for the test development studies each included at least 50 subjects. These consisted of applicants, employees, trainees, apprentices, or students. The samples were controlled for age, education, experience, job duties, availability for testing and criterion of job performance.

Analysis of Data

- after the subjects had been tested and the data analysed, trial norms were established. Three or four of the most important aptitudes for job success were chosen and cutting scores were set so that the norms would:

  qualify most of the individuals in the high criterion group

  screen out a majority of individuals in the low criterion group

The various combinations of trial norms were correlated with the criterion job performance and the combination yielding the best selective efficiency was established as the final norms for that occupation. The final norms were considered valid only when their correlation with the job criterion yielded a coefficient significant at the .05 level.

Specific norms have been developed for 464 occupations. Validity studies were of two types: predictive or concurrent. The lowest coefficient obtained was .17 and the highest was .84 with a mean of .45.

2. *Occupational Aptitude Pattern Norms*

The norms for the specific occupations proved to be time consuming and impractical since much of the value of counselling would be lost if guidance were given only on the basis of individual occupations. What was needed was a structure that would maximize the amount of information which served as the basis for making occupational recommendations. In response to this need, a third set of norms was developed called, Occupational Aptitude Pattern (OAP) Norms. The OAP consists of the three most important aptitudes and their cutting scores which are found to be the same for a group of occupations, when establishing aptitudinal requirements. The advantage of this structure is that it groups together a large number of occupations into a relatively small number of families against which the scores can be interpreted.

The procedure for establishing the OAP norms was essentially the same as that of the specific norms. First, trial norms were set up by grouping together the occupations with the most similarity. The cutting scores established for the trial norms were set at the medians of the cutting scores of the specific occupations included in the group. The trial norms were applied to the sample for each occupation under the OAP structure.

The final norms were established on the basis of their selective efficiency. The cutting scores of the OAP structure are all within ten points of the cutting scores for the specific occupations and provide a sort of average score for the group.

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The initial grouping of the occupations yielded 36 OAP's. In 1970, the structure was expanded to include 26 new ones. Many of the occupations added did not meet all of the criteria established earlier. However, their inclusion was justified on the basis of their relationship to the other occupations in the group.

There are now 62 occupational aptitude patterns covering about 1200 occupations available to the counsellor of occupational guidance. These norms exist for adults as well as for grades nine and ten.

The grouping of occupations reduces considerably the counsellor's work to interpret test scores in such a way as to give them significance.

III THE USES OF THE GATB

As already mentioned, the main role of the GATB is to predict occupational success. Norms are available for specific occupations and also for groups of occupations. On this basis, the battery has been found useful for two different purposes: Counselling and Selection.

1. *Counselling*

When using the GATB for counselling, the scores are interpreted in relation to the occupations listed in the Canadian Classification and Dictionary of Occupations. In the CCDO, the occupations are divided according to five different aptitude levels ranging from high to low. The GATB scores corresponding to these five levels are as follows:

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Aptitude Level	GATB Scores
1 - high	126-145
2 - above average	109-126
3 - average	91-109
4 - below	74- 91
5 - low	45- 74

There are a number of steps involved in the interpretation of the aptitude results:

1. first the raw scores are converted to standard scores
2. then the client's aptitude profile is traced using these standard scores
3. the Standard Error of Measurement is then added to the standard score and an adjusted profile is formed to obtain the range in which the "true" score falls.
4. the numbers which appear above the upper profile are struck out in the rectangle at the bottom of the sheet.
5. the numbers which appear between the two profiles are circled in that same rectangle.
6. the numbers which are left blank and those that are circled in the rectangle identify the OAP's for which the client qualified.

Sometimes the list of occupations for which a client qualifies can be quite extensive. In a counselling context, however, these occupations should not be considered in isolation but in relation to a number of other pertinent

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factors, such as: interests, motivation, past experience and socio-economic conditions. Based on the evaluation of these factors, the counsellor is in a position to make a selection of the most suitable occupations for his client. He may choose two or three occupations from each group for which the client qualified.

In employment counselling, the GATB has been found useful in the following types of situations:

1. - when the applicant's vocational choice seems to be above or below his capacities as shown through his school records or other factors.

2. - when the applicant has expressed definite interest in an occupation or field of work but lacks confidence in his ability.

3. - when the applicant shows conflicting vocational interests (several occupations in mind).

4. - when the applicant shows an unstable work record, for instance, if he has lost a number of jobs for other than personal or economic reasons.

5. - when the exploration of other areas of client information does not yield sufficient support for any vocational field.

Occupational Aptitude Pattern Norms have also been developed for grade nine and ten students. The cutting scores for this group are lower than they are for the adult group since the students have not yet reached aptitudinal maturity.

Studies indicate that the GATB, when used for counselling, is a valid instrument to predict high school performance, college performance and occupational performance in the area of general clerical occupations as

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early as the ninth grade. Four aptitudes constantly emerge as the best predictors of success. they are: general learning ability, numerical aptitude, verbal aptitude and clerical perception.

The usefulness of the GATB in counselling is further proven in studies demonstrating that students who followed their counsellor's advice on the basis of the GATB results enjoyed a level of job satisfaction significantly higher than the non-followers. They were also rated by their employers as being better workers.

When using the GATB for counselling students, the emphasis should be placed on long-range objectives. At this level, it is preferable to talk about broad occupational fields and to guide students toward courses which prepare them for these broad fields.

2. *Selection*

Since norms have been established for specific occupations, the GATB can be used quite reliably for purposes of selection. Classification and placement officers are interested in selecting the applicants who, on the basis of their aptitudinal qualifications will be most likely to succeed in the specific training or job available. The placement officer now has 464 test development studies at his disposition and new ones are continually being added to the list.

Studies on the effectiveness of the GATB in selection offer evidence of less turnover, higher production, lower training cost, and more earnings per hour per worker.

IV THE ADVANTAGES AND LIMITATIONS OF THE GATB

After 30 years of development, the GATB is established as a sound and valid instrument. A salient advantage is that occupational norms make it possible to test a person's vocational abilities in as little as 2½ hours and to interpret his scores in relation to a wide range of occupations.

A second positive point of the test is that the norms only include those significant aptitudes required for successful performance in the jobs covered by the Occupational Aptitude Pattern.

Another advantage is that unlike many other test batteries, the GATB does not provide for the obtaining of a total weighted score. A minimum score is set for each aptitude independently of the others, it is therefore impossible for any aptitude to compensate for another that would prove deficient.

Some limitations of the GATB should also be pointed out. For instance, it is to be noted that although the battery covers many occupational groups not all occupations are included in the norm structure, which implies that even when the counselee does not appear to meet the qualifications for the Aptitude Patterns, his counsellor should be sufficiently alert not to conclude that the client does not have aptitudes.

A second limitation of the GATB consists of the fact that in Canada we are still using American norms. However, some preliminary studies for the development of Canadian norms indicate that they are fairly similar to American norms.

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V THE DEPARTMENT'S POLICY ON THE RELEASE OF THE GATB

In Canada, the GATB is in the custody of the Department of Manpower and Immigration. It is one of the Department's main counselling tools; it relates appropriately to Manpower's objectives; it is applicable to our client population; it is practicable and efficient; and it is referred to in Vol. II of the Canadian Classification and Dictionary of Occupations.

The Department also encourages outside agencies to adopt the GATB as a counselling tool on the premise that external users, especially those involved with youth, will help prevent employment problems.

Through the medium of its External Users Program, the Department makes it possible for the following types of agencies to obtain the GATB:

1. - Public agencies (Federal, Provincial or Municipal).

2. - Private counselling or educational agencies which do not have a fee-charging placement service.

3. - Non-profit agencies engaged in training, counselling or placement.

4. - Professional consulting psychologists, when the tests are exclusively for the guidance and benefit of the client.

The release of the GATB material will, however, be dependent on certain conditions:

1. - that qualified individuals are available in the organization to use the test in accordance with applicable standards.

2. - that qualified Departmental Staff (H.Q., Regional or CMC) or other professional persons (psychologists, or counsellors) are available to introduce the test and provide training in its use when requested by the organization.

3. - that the agency has entered into a written agreement with the Department.

The demands for the GATB are increasing and so are the related costs. In view of the facts that: the External Users Program does produce long-range benefits relating to a major departmental goal; that there is no commercial outlet in Canada for the GATB; and that the program is well received by most of its users, the Department wishes to continue its present involvement.

On the other hand, a careful control is called for by a number of points, such as the lack of staff resources in the Department to review applications, provide training, and monitor the program; the lack of funds to purchase test material required for the program; and the need for further research.

Based on these observations, it is recommended that:

1. - the General Aptitude Test Battery External Users Program be continued.
2. - the qualifications of applicants be assessed in the same manner as that being proposed for Manpower Counsellors. (M.A. in psychology or formal training provided on an in-service basis).
3. - users be required to purchase the test material which is needed for the program.
4. - the Department encourage Canadian universities to provide training on the GATB in appropriate graduate or undergraduate courses.
5. - certain external users (i.e. universities) be encouraged to undertake research studies on the GATB.

APPENDIX I

TABLES AND FIGURES

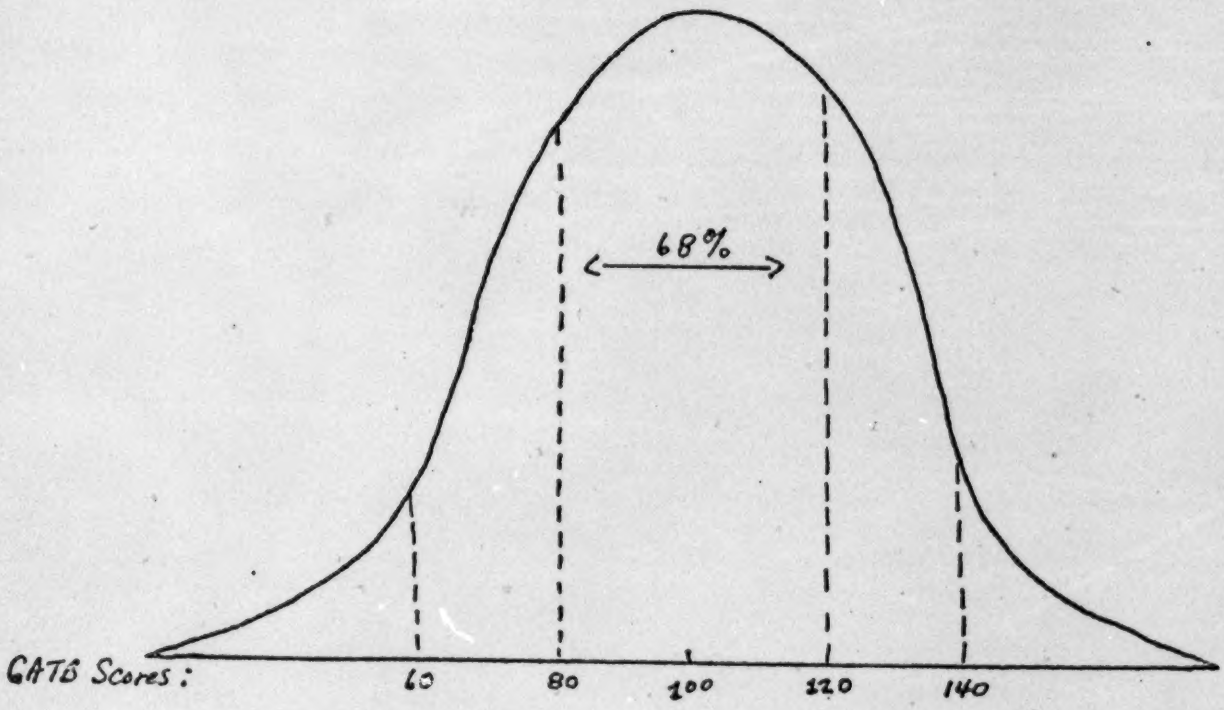
USED IN THE PRESENTATION

Aptitude		Tests
G - General Learning Ability	Ability to understand instructions and underlying principles; the ability to reason and make judgements.	Part 3 - Three-Dimensional Space Part 4 - Vocabulary Part 6 - Arithmetic Reason
V - Verbal Aptitude	The ability to comprehend language, to understand relationships between words and to understand meanings of whole sentences.	Part 4 - Vocabulary
N - Numerical Aptitude	Ability to perform arithmetic operations quickly and accurately.	Part 2 - Computation Part 6 - Arithmetic Reason
S - Spatial Aptitude	Ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects.	Part 3 - Three - Dimensional Space
P - Form Perception	Ability to perceive pertinent detail in objects or in pictorial or graphic material.	Part 5 - Tool Matching Part 7 - Form Matching
Q - Clerical Perception	Ability to perceive pertinent detail in verbal or tabular material.	Part 1 - Name Comparison
K - Motor Coordination	Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed.	Part 8 - Mark Making
M - Manual Dexterity	Ability to move the hands easily and skillfully. Ability to work with the hands in placing and turning motions.	Part 9 - Place Part 10 - Turn
F - Finger Dexterity	Ability to move the fingers and manipulate small objects quickly or accurately.	Part 11 - Assemble Part 12 - Disassemble

Aptitude	M	S.D.	G	V	N	S	P	Q	K	F
G - Intelligence	100.0	18.5								
V - Verbal Aptitude . . .	99.2	17.3	.84							
N - Numerical Aptitude . .	97.5	19.1	.86	.67						
S - Spatial Aptitude . .	101.4	20.0	.74	.46	.51					
P - Form Perception . . .	100.2	19.7	.61	.47	.58	.59				
Q - Clerical Perception .	101.8	17.6	.64	.62	.66	.39	.65			
K - Motor Coordination . .	102.1	18.7	.36	.37	.41	.20	.45	.51		
F - Finger Dexterity . . .	98.7	20.2	.25	.17	.24	.29	.42	.32	.37	
M - Manual Dexterity . . .	103.5	21.4	.19	.10	.21	.21	.37	.26	.46	.52

Means (M), Standard Deviations (S.D.) and Intercorrelations of Aptitudes in B-1002 - N = 23,428 Employed Workers, Applicants, Apprentices, Students and Trainees

Mean = 100
SD = 20



General Working Population Norms

S-124		G-85 V-80 N-90 Q-80	OAP 23(*)
1965			
	C.C.D.O.:	TRUCK DRIVER, TRACTOR-TRAILER (MOTOR TRANS.)	9175-122
		DRIVER, TANK TRUCK (MOTOR TRANS.)	9175-144
S-120		G-90 S-90 P-95 M-90	OAP 15(*)
1957			
	C.C.D.O.:	FIRE FIGHTER (ANY IND.)	6111-126
S-126		S-85 F-85 M-80	OAP 47(*)
1969			
	C.C.D.O.:	WELDER, COMBINATION (MACH., WELD. & FORG.)	8335-126
S-87		G-110 S-105 N-95 Q-95	OAP 2(*)
1963			
	C.C.D.O.:	ELEMENTARY SCHOOL TEACHER (EDUCATION)	2731-110
		SECONDARY SCHOOL TEACHER, ACADEMIC (EDUCATION)	2733-110
S-254		G-115 V-110	OAP 2(***)
1962			
	C.C.D.O.:	SOCIOLOGIST (PROF. & TECH. N.E.C.)	2313-114

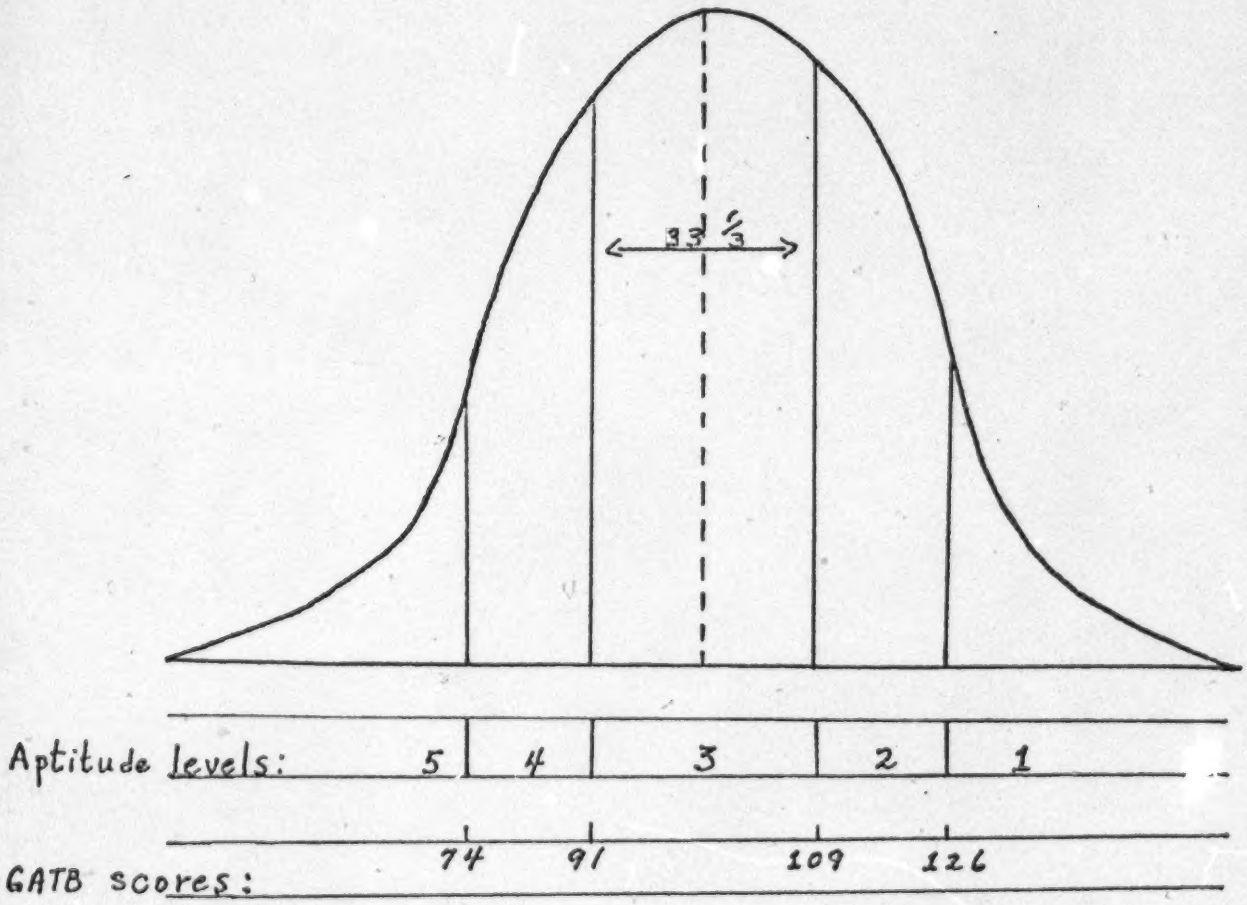
OAP - 18

Aptitude
Cutting Scores

	G	V	K
Adult	90	80	85
Grade 10	86	78	79
Grade 9	83	76	73

		Aptitude Scores								
		S#	G	V	N	S	P	Q	K	F	M
			90	80					85		
3134-110	NURSING ASSISTANT (medical)	270R	85		80			85			80
*											
3135-110	NURSE AIDE (medical)	282	80	80					85		
3135-114	ORDERLY (medical)										
3139-138	FIRST-AID ATTENDANT (medical)										
3139-142	HOMEMAKER (medical)										
4113-114	TELETYPIST (clerical)										
6147-110	BABYSITTER (pers. serv., n.e.c.)										
6149-130	CHILD-CARE ATTENDANT (pers. serv., n.e.c.)										

level 1 - high
level 2 - above average
level 3 - average
level 4 - below average
level 5 - low



The Relationship Between CCDO Aptitude Levels And The GATB Aptitude Scores.

Cat. No. 020

GATB PROFILE SHEET – FEUILLE DE PROFIL DU BGTA

ADULT – ADULTE

Client's Name
Nom du client _____

Date Tested
Date du test _____

	G	V	N	S	P	Q	K	F	M	
	Intelligence /Intelligence	Verbal/ Verbale	Numerical /Numérique	Spatial /Spatiale	Form Perception /Perception des Formes	Clerical Perception/ Perception d'Ecritures	Motor Coordination /Coordination Visuo-Motrice	Finger Dexterity /Dextérité Digitale	Manual Dexterity /Dextérité Manuelle	
	98	111	96	101	116	108	103	105	102	
HIGH / ABOVE AVERAGE	130 and above									130 et plus
	125-129	1,								125-129
	120-124									120-124
	115-119		1,	1,						115-119
	110-114	2, 3, 4	4,	6,						110-114
	105-109	5, 6, 7, 8	2, 5, 31	5, 31		4, 33				105-109
AVERAGE	100-104	9, 10, 11, 12, 13,	32,	3,	7, 13, 33	8, 13, 17, 20, 29, 31,		27,	50,	100-104
	95-99	14, 15	16,	33,	7, 15, 34, 35, 37, 41	36,	9, 14, 39, 57, 58,	6, 57	12, 32, 53,	95-99
BELOW AVERAGE	90-94	16, 17, 18	11, 12, 17, 29	14, 16, 34	10, 42	25, 34, 43, 49	11, 24, 45, 52, 59,	8, 26, 27, 29, 44, 58, 61,	20, 54,	36, 60, 61, 90-94
	85-89	19, 20, 21	30,	30, 35, 36	19, 38, 43	24, 42, 44, 50, 51,	40, 41, 60	18, 30, 50, 54,	43, 49, 61,	15, 37, 42, 47, 57, 59, 85-89
	80-84	22, 23, 24, 25, 26,	18, 22	23, 37, 38, 39, 40,	44, 45, 46, 47,	52, 53,	22, 23	25, 38, 46, 51, 60, 62,	19, 32, 35, 45, 47, 53, 56, 59,	26, 28, 40, 46, 51, 52, 56, 80-84
LOW	75-79	27, 28,			48,	48, 54, 55, 56		39, 41, 55,	28, 58, 62,	21, 48, 49, 55, 62, 75-79
	70-74							21,		70-74
	69 and under									69 et moins

O.A.P.'s	All	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62		

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P.A.P.'s

Cat. No. 020

GATB PROFILE SHEET – FEUILLE DE PROFIL DU BGTA

ADULT – ADULTE

Client's Name
Nom du client _____

Date Tested
Date du test _____

	G	V	N	S	P	Q	K	F	M	
	Intelligence /Intelligence	Verbal/ Verbale	Numerical /Numérique	Spatial /Spatiale	Form Perception /Perception des Formes	Clerical Perception/ Perception d'Ecritures	Motor Coordination /Coordination Visuo-Motrice	Finger Dexterity /Dextérité Digitale	Manual Dexterity /Dextérité Manuelle	
	98	111	96	101	116	108	103	105	102	
	6	6	6	8	9	9	7	12	11	
130 and above										130 et plus
125-129	1,									125-129
120-124										120-124
115-119			1,	1,						115-119
110-114	2, 3, 4		4,	6,						110-114
105-109	5, 6, 7, 8	2, 3, 9,	2, 5, 31	5, 31		4, 33				105-109
100-104	9, 10, 11, 12, 13,	10,	32,	3,	7, 13, 33	8, 13, 17, 20, 29, 31,		27,	50,	100-104
95-99	14, 15	16,	33,	7, 15, 34, 35, 37, 41	36,	9, 14, 39, 57, 58,	6, 57		12, 32, 53,	95-99
90-94	16, 17, 18	11, 12, 17, 29	14, 16, 34	10, 42	25, 34, 43, 49	11, 24, 45, 52, 59,	8, 26, 27, 29, 44, 58, 61,	20, 54,	36, 60, 61,	90-94
85-89	19, 20, 21	30,	30, 35, 36	19, 38, 43	24, 42, 44, 50, 51,	40, 41, 60	18, 30, 50, 54,	43, 49, 61,	15, 37, 42, 47, 57, 59,	85-89
80-84	22, 23, 24, 25, 26,	18, 22	23, 37, 38, 39, 40,	44, 45, 46, 47,	52, 53,	22, 23	25, 38, 46, 51, 60, 62,	19, 32, 35, 45, 47, 53, 56, 59,	26, 28, 40, 46, 51, 52, 56,	80-84
75-79	27, 28,			48,	48, 54, 55, 56		39, 41, 55,	28, 58, 62,	21, 48, 49, 55, 62,	75-79
70-74							21,			70-74
69 and under										69 et moins

LOW | BELOW AVERAGE | AVERAGE | ABOVE AVERAGE | HIGH

~~All~~	~~8~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	(9)	(10)	(11)	(12)	(13)	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	~~31~~	(32)	33	34	35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62		

O.A.P.'s

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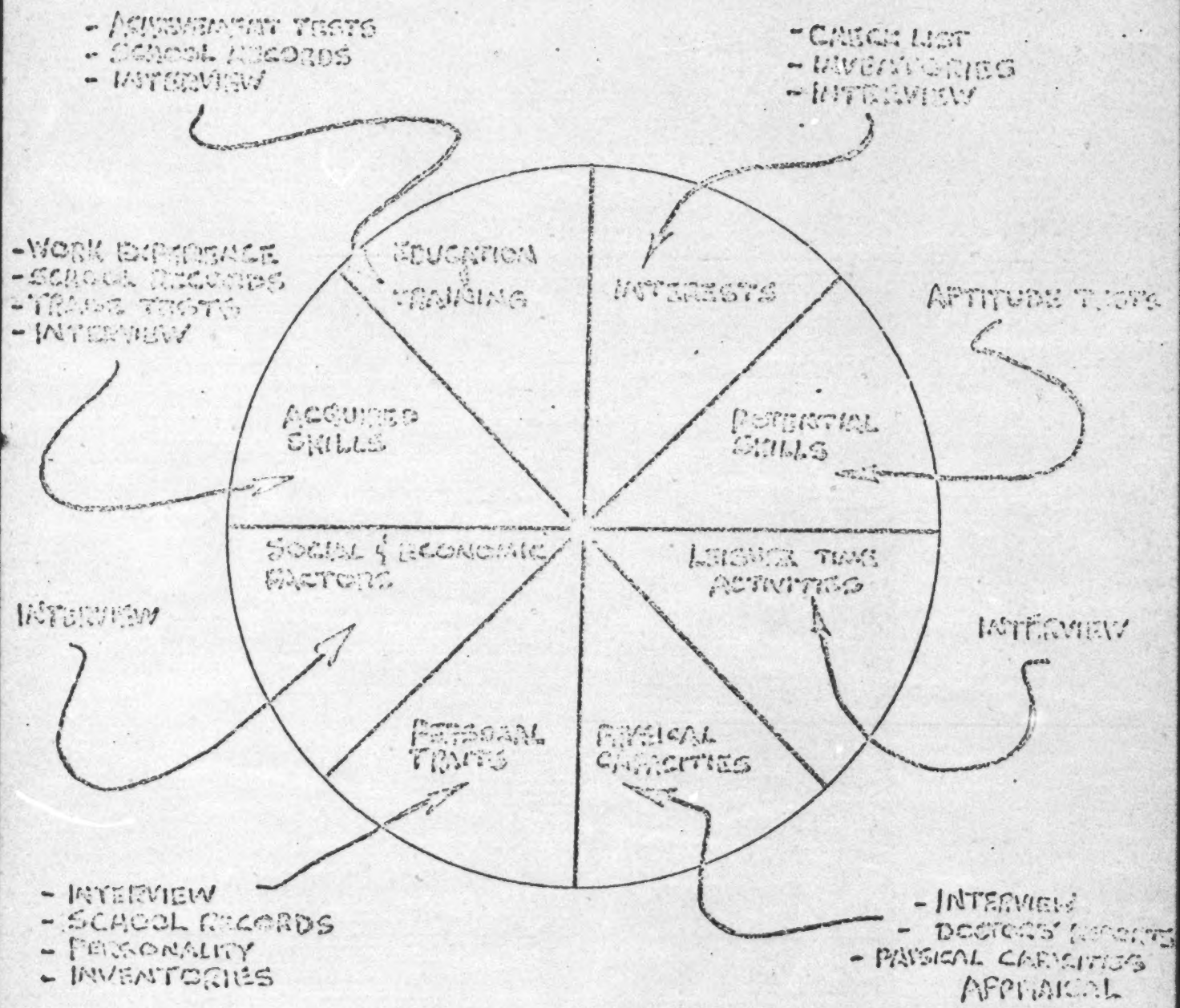
P.A.P.'s

Chart 1



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